The Environmental Challenge

Mirror Lake, Yellowstone, 1880.

Public Affairs Office, Corps of Engineers

As explorers and mapmakers for the pioneers, the engineers were among the first to recognize the need for protection of natural resources. As early as the 1840s, when the vast herds of buffalo seemed limitless to most travelers, engineer officers warned of their impending destruction. Captain Howard Stansbury noted their shrinking ranges and warned that the buffalo "seem destined to final extirpation at the hands of men." These officers were nearly correct, but one of the few surviving buffalo herds today is protected at a Corps of Engineers project.

The Corps of Engineers was also influential in the creation of the first national park at Yellowstone in 1874, and the Corps operated and protected that park for many years. Captain William Ludlow and an engineer survey party at Yellowstone in the 1870s confronted tourists, harbingers of the future, carving their initials, scattering their rubbish and breaking off pieces of rock formations. Alarmed, Ludlow pleaded with the visitors to respect nature's work. He stopped one woman, poised with a shovel over a mound formed over thousands of years by a bubbling spring's mineral deposits, in time to prevent her smashing the formation. In his report, Ludlow proposed several ways to protect the new park. His recommendations, including military patrols and engineer construction of roads, were adopted. Thanks to Ludlow, who provided the blueprint for saving the park, Yellowstone remains among the crown jewels of America's scenic wonders.

To prevent the obstruction of navigable waterways, Congress in the 1870s directed the Corps to regulate the construction of specific bridges. The job was expanded during the 1880s and '90s to prevent dumping and filling in the nation's harbors, a program that was vigorously enforced by the engineers. At the port of Pittsburgh in 1892, for instance, the Corps took a grand jury on a boat tour of the harbor and obtained some 50 indictments of firms dumping debris into the harbor. When the engineers learned that firms were piling debris on the streambanks during the day and pushing it into the harbor at night,

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Original Baronett Bridge, first across the Yellowstone River, built in 1871.

Buffalo grazing at Yellowstone, 1880.

National Archives

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Assessing a "sea curtain" for containing oil spills.

they began night patrols in fast boats with searchlights.

In 1893 a citizen of an Ohio River city complained to the Corps that the city was dumping into the river "household garbage, refuse of wholesale commission and slaughter houses, wagon loads of decaying melons, fruit and vegetables and carcasses of animals." The city officials replied that the complaint was exaggerated—very few dead animals were dumped in the river—and refused to stop the practice because the city then would have to build incinerators to dispose of the refuse. The Corps managed to stop the dumping anyway, forced the city to build an incinerator and prosecuted the offenders, arguing that the garbage formed piles sufficient to obstruct navigation.

In the Rivers and Harbors Act of 1899, Congress gave the Corps the authority to regulate almost all kinds of obstructions to navigation. The engineers were disappointed that they were not also given authority to deal with polluters, for many of their personnel lived on the waterways on a daily basis and water quality was an immediate personal concern.

The Corps used the Rivers and Harbors Act of 1899 to the fullest extent legally possible to protect the environment of navigable waterways. In one extreme instance the Corps managed to stop a firm from discharging a liquid effluent into a waterway by contending in court that the discharge obstructed navigation because it entered steamboat boilers and corroded them to the extent that repairs were necessary. The Oil Pollution Act of 1924 gave the Corps the responsibility of insuring that offensive and dangerous oil discharges did not pollute the nation's harbors. However, the Corps could not adequately control the problem because of lack of regulatory power and insufficient manpower, and Corps officers periodically urged Congress to grant the agency adequate authority and resources.

The Corps' regulatory authority was expanded by the Clean Water Act (Federal Water Pollution Control Act) of 1972 to include all waters of the United States. The Corps began to regulate discharges of dredged or fill materials into any waters of the United States and the permit program that resulted gave environmental protection the fullest consideration. "We would like to commend the Corps for the will with which it is turning to carrying out the responsibilities Congress gave it in Section 404 for protecting the water quality on which the health and economic well-being of every American depend," said a member of the Natural Resources Defense Council.

Along with protective measures for the environment, the Corps at its authorized projects pursues an active program for the preservation of cultural resources. Recent legislation stipulates that up to one percent of the funds for a project can be expended for cultural resource surveys, for artifact and data recovery, and for mitigation efforts. The Corps' cultural resource preservation effort has had substantial results. For example, the Corps relocated a navigation lock on the Tennessee-Tombigbee Waterway to avoid destroying an Indian burial ground; and in Pennsylvania the Corps moved a unique 19th-century wagon works from a project area to preserve it. To avoid accidental destruction of archeological sites, the Corps is searching for the homes of ancient tribes, especially along the coasts where dredge disposal sites are needed.

The Corps' responsibility for improving and maintaining navigation on the nation's waterways requires the dredging of channels if they are to remain open. In 1969 the dredging program was attacked as environmentally unsound. "All of a sudden, dredging became a four-letter word," remarked Lieutenant General John Morris of the Corps. "Now this came as rather a surprise to us," he continued, "since dredging has been a daily activity within the Corps for 150 years and nobody paid much attention to it."

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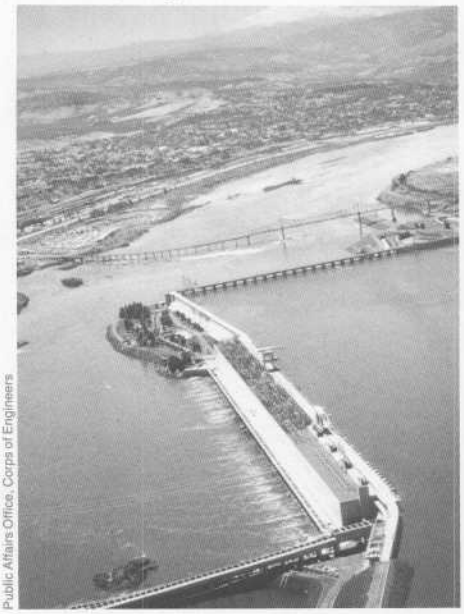
Restored Gruber Wagon Works, Berks County, Pennsylvania

The Dalles, Oregon.



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In 1970 the Corps began a dredged material research program to identify dredging and dredged disposal systems that would be compatible with the new environmental protection mission. Completed in 1978, the dredged material research program reversed some traditional thinking about the effects of dredging. It indicated that dredging need not have adverse impacts on aquatic life and that dredged materials can create new wetlands and wildlife management areas. The research identified improved methods for constructing diked disposal areas and for using physical, chemical and biological agents in the dredging process and it demonstrated that dredged fill can be used to reclaim strip-mined lands and other environmentally damaged areas.

Streambank erosion can have major detrimental impacts on the environment and human welfare. It results in sediment deposits in reservoirs and waterways; it impairs navigation, flood control and water supply project effectiveness; it blights valuable recreation areas and streambank lands. Since 1969 the Corps has conducted intensive studies of streambank erosion, with demonstration control projects along the Missouri, Ohio and Yazoo rivers, in an effort to identify the causes of such erosion and to find new techniques for bank protection. The studies of this form of environmental degradation have identified the causes of streambank erosion and have indicated some potential new techniques for its control.

The Corps' coastal engineering research program since 1969 has devised some innovative approaches to the problems of beach erosion, coastal storm damages and navigation along the coastline. Analysis of wave patterns has opened the way to rational design of rubble mound structures for the protection of threatened beaches and coastline. Possible uses for beach and marsh grasses in control of coastal erosion have been identified. And the research has established some basic relationships governing the size and shape of coastal inlets and harbor entrances.

Fish and wildlife conservation has been a concern of the Corps since Captain Stansbury warned that the buffalo were disappearing. The engineers built the first federal fish hatchery in 1879–1880 and have included such features as fish ladders in project planning for many years. Corps projects are designed to minimize damage to fish and wildlife resources, and the Corps enhances wildlife resources at its projects through effective wildlife management. Approximately 2.5 million acres of land are primarily used for fish and wildlife purposes; one-fifth of this land is managed by other federal and state agencies in cooperation with the Corps.

The intense interest of the Corps in fish and wildlife management derives in part from the program's value to the recreational functions at 463 Corps water resource projects covering an aggregate of more than 11 million acres. Over 400 million visitors annually enjoy fishing, hunting, swimming and other water-related sports at Corps recreation areas.

Through its floodplain management program begun in 1960, the Corps provides technical services and planning guidance for many local agencies and groups to encourage prudent use of floodplains. At the request of local agencies, the Corps studies specific areas to identify flood hazard potentials, to establish standard project floods and flood frequency curves, and to map the floodplains. The resulting information is used by the local agencies to regulate floodplain development, even to the extent of evacuating floodprone areas and converting them to recreation parks or fish and wildlife habitats.